

## CLAIMS

We claim:

1. Compound capable of modulating, at least partially, the interaction between the PAP1 protein, or a homolog of this protein, and parkin.
2. Compound according to claim 1, characterized in that it slows, inhibits or stimulates, at least partially, said interaction.
3. Compound according to either of claims 1 and 2, characterized in that it is capable of binding the domain of interaction between the PAP1 protein, or a homolog of this protein, and parkin.
4. Compound according to one of claims 1 to 3, characterized in that it is a compound of peptide, nucleic acid, lipid or saccharide type, or an antibody.
5. Compound according to claim 4, characterized in that it is a peptide compound comprising all or part of the peptide sequence SEQ ID NO: 2 or a derivative thereof.
6. Compound according to claim 4, characterized in that it is a peptide compound comprising a region of which the sequence corresponds to all or a functional part of the site of interaction of the PAP1 protein with parkin.
7. Compound according to claim 4, characterized in that it is a peptide compound which is derived from the PAP1 protein (and/or from the homologous forms), and which bears an effector region which has been made nonfunctional.
8. Polypeptide comprising the sequence SEQ ID NO: 2 or a derivative or fragment of this sequence.
9. Polypeptide according to claim 8, comprising at least 5 consecutive residues of the sequence SEQ ID NO: 2, preferably at least 9, more preferably at least 15.
10. Polypeptide according to claim 8, comprising all or part of sequence SEQ ID NO: 13, 15, 43 or 45 or of a variant of these sequences, in particular at least 5 consecutive residues, preferably at least 9, more preferably at least 15 consecutive residues of the sequence SEQ ID NO: 13, 15, 43 or 45.
11. Nucleic acid encoding a peptide compound according to one of claims 4 to 10.
12. Nucleic acid according to claim 11, characterized in that it comprises all or part of the sequence SEQ ID NO: 1, 12, 14, 42 or 44, or a sequence which is derived from these sequences.

13. Nucleic acid encoding a polypeptide according to claim 8 or 11.
14. Nucleic acid, in particular a nucleotide probe, which is capable of hybridizing with a nucleic acid according to one of claims 11 to 13, or with their complementary strand.
15. Vector comprising a nucleic acid according to one of claims 11 to 14.
16. Recombination-defective virus comprising a nucleic acid according to one of claims 11 to 14.
17. Nucleic acid chosen from among the nucleic acids of sequence SEQ ID NO: 16-41, 46.
18. Antibody or antibody fragment or derivative, characterized in that it is directed against a peptide compound according to one of claims 4 to 10.
19. Antibody according to claim 18, characterized in that it recognizes a polypeptide according to claim 9 or 10.
20. Pharmaceutical composition comprising at least one compound according to one of claims 1 to 10, or an antibody according to claim 18 or 19.
21. Nonpeptide compound or a compound which is not of exclusively peptide nature, which is capable of modulating, at least partially, the interaction of the PAPI protein, or a homolog of this protein, with parkin.
22. Compound according to claim 21, characterized in that the active motifs of a peptide according to one of claims 5 to 7 have been duplicated with a structure which is not a peptide or which is not of exclusively peptide nature.
23. Pharmaceutical composition comprising at least one nucleic acid according to one of claims 11 to 14, or one vector according to claim 15 or 16.
24. Pharmaceutical composition comprising a peptide compound according to one of claims 4 to 10.
25. Composition according to claim 22, 23 or 24, intended for treating neurodegenerative pathologies.
26. Method for screening or for characterizing active molecules, which comprises a step of selecting molecules which are capable of binding the sequence SEQ ID NO: 2 or the sequence SEQ ID NO: 4, or a fragment of these sequences.
27. Method for screening or for characterizing active molecules, which comprises a step of selecting molecules which are capable of binding a sequence chosen from among SEQ ID NO: 13, 15, 43 and 45 or a fragment of these sequences.

28. Method for producing a peptide compound according to one of claims 4 to 10, comprising the culture of a cell which contains a nucleic acid according to one of claims 11 to 14 or a vector according to claim 15 or 16, under conditions for expressing said nucleic acid, and the recovery of the peptide compound produced.

29. Human PAP1 protein in isolated form.

30. Cell which contains a nucleic acid according to one of claims 11 to 14 or a vector according to claim 15 or 16.

31. A non-human mammal which comprises in its cells a nucleic acid according to one of claims 11 to 14.